Art. XXVI. — *Further Coccid Notes: with Description of New Species, and Discussion of Points of Interest.*

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Plates XXIII.–XXVII.

The majority of the new species recorded in this paper form part of a collection of *Coccidæ* made by Mr. A. Koebele, in China and Japan, in 1896 and 1897. In my paper of last year I was able to include about thirteen species from this collection, but the rest did not reach me until too late for publication then. I sent to the Entomologists' Monthly Magazine in October, 1897, an advance list of all of these, and the new species described in this paper were briefly mentioned in it. As regards species already known, also included in the Koebele collection, I must refer students to the numbers for October and November, 1897, of the Ent. Mo. Mag.

An excellent work has been published during 1897 by Mr. Cockerell on the "Food Plants of *Coccidæ*," in which he brings together in a compact and convenient form all the knowledge we have up to the present as to the plants attacked by all the species of Coccids. The work is a very welcome and very useful one, and must have required much industry and research. It is inevitable that in such a publication there should be a few points requiring rectification, but these seem to be not of much importance. I may mention two or three. On page 728, near the bottom, it is stated that "*Aspid. camelliæ* is *A. rapax*"; but *A. rapax* is frequently mentioned in the book, which must be an error, as the name *camelliæ* has priority. On page 733 it is stated that I once identified my own *Dactylopius vastator* as my own *D. albizziæ*. This would have been indeed a peculiar mistake, the two being absolutely dissimilar; but I cannot account for the statement. On page 755 it is suggested that my *Poliaspis media* and *Planchonia epacridis* may be Australian, being found in New Zealand on *Leucopogon fraseri*, which is an Australian plant. In the first place I must respectfully decline the accusation that I ever called *Planchonia* by the name *Asterolecanium*. However, *Leucopogon fraseri*, whether Australian or not, is a native of New Zealand.

But there is an error in the work of more importance than these small points, and it is one for which Mr. Cockerell is not

in the least responsible, for it has been made by every writer on Coccids down to the year 1897. It is that, as stated on his page 782, *Icerya seychellarum* attacks the sugar-cane. According to Mons. d'Emmerez de Charmoy ("Revue Agricole de l'Ile Maurice," April, 1897) this insect never touches sugar-cane. "During many years," he says, "that I have given close attention to the parasitic insects of sugar-cane I have never known one single instance where this insect was found on cane, or even on any gramineous plant, in spite of its almost omnivorous character, . . . not even accidentally, when other plants in the immediate neighbourhood of a cane-field were infested with it." M. de Charmoy repeats the same thing in a letter to me. I may observe that in 1896, reporting this species from China, on *Rosa* and *Podocarpus* (Trans. N.Z. Inst., vol. xxix., p. 330), I remarked that it evidently was not confined to the sugar-cane.

It is easy to understand how this curious—and in a way, possibly, mischievous—error came about. It arose from the far-too-common practice of speaking of injurious insects by the vulgar names used by farmers and gardeners. It appears that every scale in Mauritius which produces white cotton is called "le pou blanc," or "le pou à poche blanche"; and when the insect in question was first described from that island it was assumed that it was identical with the *Coccus sacchari* of Guérin Menneville, 1867, which Signoret, in 1875, placed in his new genus *Icerya*, stating that "it does great damage to sugar plantations." Afterwards it was found to be identical with an insect from the Seychelles Islands, which Westwood, in 1855, had described as *Dorthezia seychellarum*, on palm-trees; but the sugar-eating propensity was still attributed to it. Every writer on Coccids, from Signoret and Riley to Cockerell and myself, fell into this mistake. Now, it appears that "le pou blanc," or "le pou à poche blanche," really means three (quite possibly more) different things—*Icerya seychellarum*, *Dactylopius sacchari*, and *Pulvinaria gasteralpha*, of which the second is certainly a sugar-pest; and also (as M. de Charmoy informs me) even *Diaspis amygdali*, because it is white; and that *I. seychellarum* infests nearly everything except gramineous plants.

M. de Charmoy tells me that he proposes to apply the name "le pou blanc" to *I. seychellarum*, "le pou à poche blanche" to *Pulvinaria gasteralpha*, and "le pou de la canne" to *Dactylopius sacchari*. This will, of course, be some improvement; but, personally, I would deprecate the use of trivial names. Some day we shall be falling into extreme confusion in consequence of them. Our friends in America are the chief sinners in this respect. Such names as "the white scale," "the black scale," "the round scale,"

"the long scale," "the San José scale" may be good enough for newspapers or for farmers' meetings, where every Coccid is a "scale" and every other insect a "worm" or a "bug," but they are out of place in a publication emanating from a scientific society or a scientific department, and the case of *Icerya seychellarum* is a proof of it.

In one of his letters to me M. de Charmoy enclosed a photograph showing that part of a *Ceroplastes* (species not indicated) which contains the dorsal abdominal lobes. These lobes are slightly expanded, and from between them there extrudes a cylindrical tube, slightly dilated at the tip, which. M. de Charmoy rightly recognises as the honeydew organ. I am much pleased to get this photograph, which demonstrates the correctness of my observation in 1886 of a similar organ in *Ctenochiton*, a genus nearly allied to *Ceroplastes*. I think that no other writer has mentioned this organ, although the great prevalence of fungoid growth (black blight, smut, &c.) on plants infested by Coccids shows what a quantity of honeydew they must excrete.

Notes on the Genus *Aspidiotus*.

Two publications have appeared during the year which deal with *Aspidiotus*, and both propose to divide it into a number of sub-genera. One is merely a preliminary synoptical key, without detailed description, by Dr. G. Leonardi, of the Laboratory of Economic Entomology at Portici, Italy. This suggests nine sub-genera, all founded upon the anatomical features of the female insect, without taking any notice of the puparium. This, if subdivision is required, seems to be quite the correct principle to proceed upon, though I confess that the nomenclature of details (in Latin) is to me not clear; for example, I scarcely know what is meant by "trulla," though probably it signifies "lobe"; and "paraphyses" I do not understand. But, unless Dr. Leonardi proposes to give much fuller details when defining completely his sub-genera, I think that some of his characters are scarcely valid. Thus, he separates *Odonaspis* from *Chentraspis* merely by the presence or absence of spinneret groups. I believe that this may be a valid character for distinction of species; but, seeing the very great variation in the groups even of any given species, even sometimes amongst several insects on the same leaf or twig, it can scarcely be sufficient for genera. For example, in *Aspidiotus* (*Chentraspis*, Leon.) *unilobis* I have, since my original description, seen a specimen with two orifices on one side and one on the other. I did not think the matter important enough to mention it at the time; but clearly these three orifices represented "groups"; consequently the absence of

groups is not constant. On this view three of Dr. Leonardi's genera would disappear—*Chrysomphalus, Aonidiella, Aspidites.*

The other publication is by Mr. T. D. A. Cockerell, and is entitled "The San José Scale and its Nearest Allies," but it is really a revision of the whole genus *Aspidiotus.* In this work Mr. Cockerell partly agrees with Dr. Leonardi, but he goes much farther, and on the whole proposes thirteen subgenera. For these, as far as I can make out, he employs both the puparium and the insect; but his definitions are vague and difficult to understand. For example, he includes in one group *Chrysomphalus, Melanaspis, Mycetaspis,* and *Aonidiella;* but all that he gives for comparison is "*Melanaspis,* a modified *Chrysomphalus*"; "*Mycetaspis,* a greatly modified *Chrysomphalus,*" &c. Again, "*Pseudaonidia,* type *A. duplex,* a remarkable Asiatic type"; *Xerophilaspis,* an extraordinary little form," &c. As for the main genus *Aspidiotus,* he attaches to it the letters "s. str.," of which I cannot as yet conjecture the meaning. It will be seen that some of Mr. Cockerell's names are the same as those of Dr. Leonardi, and I gather that on the whole the two writers agree.

There are a few points in Mr. Cockerell's paper as to which I shall have something to say presently; meanwhile, on the general question of generic subdivision, I must observe that it seems to me entirely premature. In my opinion it will be none too late twenty years hence to begin this work. The systematic study of *Coccidæ,* in the proper sense, does not date back beyond 1860, and even now there are scarcely twenty names known of men who devote themselves to it thoroughly (I exclude those who merely take it up in a fragmentary way, or in the intervals of economic or other work). Moreover, very few countries have yet been explored to any extent. The greater part of Asia, of North and South America, of the Pacific Islands, and even of Europe, is unworked; and whereas the total number of species of all the genera of *Coccidæ* which are now known to science does not exceed, if even it reaches, one thousand, it is absurd to imagine that we have discovered more than a fraction of those existing in the world. It results, as a matter of course, that any scheme of subdivision of so small a genus of insects as *Aspidiotus* must be continually subject to revision, to rerevision, to revision a fourth or a tenth time as new forms are found to obliterate the boundaries laid down by this or by that author. There is not the least cause for hurry. If all the species now known are left in *Aspidiotus* no harm can be done; whereas if all the suggested sub-genera have to be again divided, split into minuter fragments, shifted about

to suit the needs of the day, the future student must be subjected to confusion and trouble quite annoying and wearisome. I have already remarked that *Odonaspis* and *Chentraspis*, as they now stand, require alteration: such names as *Pseudodiaspis*, *Morganella*, *Xerophilaspis*, &c., invented to suit single species differing from others only in trivial details, will surely have to be abandoned. I observe also in Mr. Cockerell's list not less than twenty-two species which he is unable to attach to any one even of the long series of sub-genera proposed by him. This can only indicate that the series will have to be extended by perhaps half a dozen more very shortly; and there will be no end to it.

I willingly acknowledge the great industry and acumen manifested in Mr. Cockerell's work, and have no doubt that when Dr. Leonardi publishes the full details of his scheme the same qualities will be abundantly manifested. Yet the thing is premature, and it would probably be better to leave *Aspidiotus* alone for at least several years to come, as also *Lecanium* and other sub-families of *Coccidæ*.

As to a few matters of detail to which I remarked just now that exception must be taken, I find Mr. Cockerell stating (page 15) that he is convinced that my variety of *A. perniciosus*, found on *Eucalyptus* in Australia, does not belong to that species. I can only say that I am just as convinced that it does, and this after repeated examination and comparison of my specimens.

I cannot accept the proposed *Morganella maskelli*, Cockll., not only as to the new sub-genus, but as to the species. As for the genus, the insect is made to differ from *Aspidiotus longispina* (to which I had attached it in 1894) by having its lobes contiguous and the scaly hairs of the margin serrated. Surely neither of these can possibly be considered generic, or even subgeneric, characters. As for the species, I have compared it with type of *longispina* sent to me by Mr. Morgan, and I do not see the least difference in the lobes. The serrated hairs are different, certainly, and probably the insect may be a variety of *longispina*, as I put it in this paper, but I am quite unable to consider it as anything more, for it agrees absolutely with that species in every particular except these serrations.

I do not see in Mr. Cockerell's list any mention of *Aspidiotus camelliæ*, Boisduval, but *Aspidiotus rapax*, Comst., is included. But these two are identical, and Boisduval's name dates from 1867, Comstock's from 1880. The omission of one of these indicates that Mr. Cockerell acknowledges the identity; but, if priority is to be of any value, he should have inserted *camelliæ* and left out *rapax*.

Section DIASPIDINÆ.

Genus Aspidiotus.

Aspidiotus secretus, Cockerell, var. **lobulatus,** var. nov.

The type of this species was partly described by Mr. Cockerell in the Supplement to "Psyche," March, 1890. A fuller description, with figures, is given by Mr. Green in "Coccidæ of Ceylon," part i., p. 64, 1896. The insect lives "between the layers of the dry sheathing petioles of bamboo."

The present variety differs from the type in having a clear and distinct small lobe at each side of the single large median terminal lobe; in the type these lateral lobes do not exist. The two large groups of spinnerets are joined at the top by a single line of orifices. Mr. Green says that in the Cingalese form this line is wanting.

Hab. In Japan, on *Bambusa,* sp. My specimens were sent by Mr. Koebele from Miyanoshita; he attached them to the genus *Diaspis,* judging probably from the appearance of the male puparium, but I agree with Mr. Green that, as this is not carinated, the species belongs to *Aspidiotus.*

This is No. 1513 of the Koebele collection.

Aspidiotus dictyospermi, Morgan, var.

This variety differs from the type only in having a rather lighter-coloured puparium and in the spinneret groups. I examined five specimens; three of them had no spinnerets at all, the two others had six orifices in each upper group (the type has three or four) and four in each lower group (the type has two). These differences are indeed scarcely sufficient to constitute even a valid variety.

Hab. In China, on *Erythrina indica.* Specimens from Hongkong, sent by Mr. Koebele (his No. 1528).

Aspidiotus rossi, Maskell.

Mr. J. G. O. Tepper, of Adelaide, sends me the following note as to this species: "*A. rossi* breeds specially well on *Coccoloba,* apparently without injuring it, even in large numbers, likewise on *Hyssop* and *Artemisia;* but even a few injure, and a moderate number kill, *Abutilons,* notably the smaller kinds, as if they were poisoned." Seeing that *A. rossi* is spreading to several countries outside Australia, these remarks will be interesting.

Aspidiotus cydoniæ, Comstock, var. **tecta,** var. nov.

The insect agrees entirely with the type in the lobes, hairs, and spinnerets, but the puparium differs, being flatter and also subcortical, with a thin covering of bark-cells.

Hab. In the Sandwich Islands (where also the type exists),

on "ohia" tree. Specimens from Mr. Koebele (his No. 1561).

Writing in 1894 on *Chionaspis biclavis*, Comst. (Trans. N.Z. Inst., vol. xxvii., p. 49), I established a new variety of the species, characterized by lying exposed outside the bark instead of mining beneath it. In the "Report of the Californian State Board of Horticulture for 1895–96," p. 37, Mr. A. Craw expresses the opinion that "this is very poor ground upon which to erect even a variety." I venture to differ from him, considering that the habit of burrowing or not burrowing is quite important enough to warrant the placing of such emphasis upon it as is implied by the word "variety."

Aspidiotus bilobis, sp. nov. Plate XXIII., fig. 1.

Female puparium greyish or yellowish-grey, convex, rather solid; pellicles not quite central. Diameter about $\frac{1}{25}$ in.; outline subcircular.

Male puparium similar in colour and texture to that of the female, but smaller and more elliptical.

Adult female yellow. Abdomen terminating in two median lobes, which are cylindrical with rounded ends; the sides are straight and parallel, the ends minutely serrated. Separated from these lobes by a small interval in which there are one or two fine hairs is a small denticulate projection on each side, which is scarcely distinct enough to be considered a lobe; and there are also a few triangular scaly hairs. No groups of spinnerets, but at the extremity of the abdomen there are a number of very small dorsal circular pores.

Hab. In China, on grass. The insects appear to affect the roots, or the lower parts of the stem just above the ground. My specimens are from Hongkong, sent by Mr. Koebele (his No. 1518).

This species seems to be allied to *A. camelliæ*, in which also there are only two terminal lobes and no groups of spinnerets. But the lobes in the present case are quite cylindrical and *direct*, whereas in *A. camelliæ* they are broadly and roundly triangular and *oblique*, sloping inwards.

Aspidiotus longispina, Morgan, var. **ornata,** var. nov.

This species was first described by Mr. A. Morgan in the Ent. Mo. Mag., August, 1889, on *Cupania*, from Demerara. In 1894 (Trans. N.Z. Inst., vol. xxvii., p. 38) I reported it on various trees in the Sandwich Islands. I have it again in Mr. Koebele's collection (no number attached) from the same locality; and I have lately received it on an unnamed plant from Mauritius, sent by M. d'Emmerez de Charmoy. It is clearly a tropical form—at least, no report of it has come from a temperate region.

The variation here noted consists in the fact that the long scaly hairs on the abdominal margin are conspicuously serrated and even branched, whereas in the type they are simple. Writing of the species in 1894, I noted the point, but did not think it necessary to even found a variety upon it. However, now that it appears from two such widely-separated localities as Honolulu and Mauritius it may fairly be considered a variety from the serrations. In 1894, also, I mentioned that the marginal long setæ seemed to be six on each side, instead of four, as in the type. I do not find this to be a constant character; some specimens exhibit four, some six; this must therefore be discarded.

I have already mentioned (*ante*, p. 223) that Mr. Cockerell's proposed new sub-genus for this form, and his name, *Morganella maskelli*, cannot be accepted. Every single character, with the exception of the serrated hairs, agrees with the type of *longispina*, and the difference is too trivial to even make a new species. As regards a point mentioned by Mr. Cockerell, "closely adjacent or contiguous median lobes," that is not valid. Taking two specimens, one of the type the other of the variety, it requires very close examination indeed to see which has the closer lobes; and even then I think any difference may be accounted for by more or less pressure of a coverglass.

I therefore maintain my specific determination, but am willing to consider the form as a variety.

Aspidiotus implicatus, sp. nov.

Female puparium subcircular, white, slightly convex, thin and papery; pellicles pale-yellow, very indistinct. The puparia are entangled amongst the close thick hairs of the plant, and are very inconspicuous. Diameter about $\frac{1}{40}$ in.

Male puparium whitish, elliptical, flat, non-carinated; length about $\frac{1}{65}$ in.

Adult female yellow. Abdomen exhibiting two median terminal lobes, sloping inwards, the outer margin of each with a conspicuous notch, and a smaller notch on the rounded extremity. Beyond the lobes are on each side two deepish indentations of the margin, and several scaly hairs, of which some are simple, others broad and conspicuously forked. The spinnerets vary: in some specimens none at all are visible; in others there is a single superior orifice, and either one or two on each side.

Hab. In China, on *Campanula*, sp. (? the name of the plant was indistinct on the parcel). Specimens sent from Tamsui, Formosa, by Mr. Koebele (his No. 1498).

This species appears to be intermediate between *A. camelliæ* and *A. cydoniæ*, but is much smaller than either. The deep

notches in the lobes separate it from *camelliæ*, and the absence, or almost absence, of spinnerets from *cydoniæ*.

Genus AONIDIA.

Aonidia elæagnûs, sp. nov. Plate XXIII., figs. 2, 3.

Female puparium circular, rather solid, yellowish-brown or reddish-yellow in colour; diameter about $\frac{1}{30}$ in.; almost entirely occupied by the second pellicle; the first pellicle is small, yellow, and usually placed in a circular depression.

Male puparium elliptical, rather lighter-coloured than that of the female, the pellicle yellow, terminal; length about $\frac{1}{25}$ in.

The larval pellicle is oval, and exhibits at the posterior extremity indications of terminal lobes.

The second female pellicle, which occupies almost the whole puparium, is elliptical, tapering posteriorly, and ends in six slender cylindrical emarginate lobes, all sloping inwards.

Adult female yellow, or brownish; length about $\frac{1}{50}$ in. The cephalic and thoracic regions largely overlap the abdominal. Abdomen triangular, with nearly straight emarginate sides, terminating in a single median lobe; this lobe is slightly notched on each side, and has a deep indentation on the terminal edge, so that it looks as if it were double. Separated from it by a short interval along the margin is another very small lobe, and still further along another still smaller (or, indeed, rather an indication of a lobe). There are no hairs or spines except one or two, very short and fine, on the anterior abdomen. No groups of spinnerets, but there are a few minute circular pores near the posterior margin.

Male unknown.

Hab. In Japan, on *Elæagnus macrophylla*. My specimens were sent by Mr. Koebele (no number attached to them).

This form is clearly distinct from any of the species of this genus described by Mr. Green from Ceylon, and from all others known to me. The abdominal characters in many species of this genus are most peculiar.

In the *Agricultural Gazette* of New South Wales, August, 1897, Mr. C. Fuller describes a Diaspid insect forming galls on *Eucalyptus* in Australia, to which he gives the name *Maskellia globosa*. In its gall-making habit this insect is quite distinct from *Aonidia elæagnus;* but the figure of the abdominal region given by Mr. Fuller bears a remarkable resemblance to that of the Japanese form, with the exception of the projection on the anterior margin, which, however, is not important. In the six minute widely-separated lobes (assuming that in *M. globosa* there is really a median pair, and not one double), in the

absence of spinneret groups, and in the position of the scattered single orifices the two are precisely similar. I suppose, however, that the gall must be taken as a sufficient character for distinction.

Genus Diaspis.

Diaspis rosæ, Sandberg, var. **spinosa**, var. nov.

Puparia of both female and male resembling those of the type, but the colour of the adult female is brown instead of red, and the spines on the abdominal margin are much more numerous. In the type there are only seven or eight on each side, but in the present variety there are from fourteen to eighteen. The spinneret groups and lobes are as in the type, and the male puparium is distinctly carinated.

Hab. In Japan, on *Smilax*, sp. Specimens sent by Mr. Koebele from Atami (his No. 1545).

In "Coccidæ of Ceylon," part i., page 91, Mr. Green describes *D. fagræcæ*, a species very close to *D. rosæ;* but he states that the male puparium is not carinated (which would seem to remove it from *Diaspis*). This character at once separates it from our variety; moreover, its pellicles are dark-red. *Aspidiotus smilacis*, Comstock, is quite different.

Diaspis amygdali, Tryon, var. **rubra**, var. nov.

The differences from the type are, first, the deeper red colour of the pellicles, which is quite conspicuous; and, secondly, the comparative smallness of the terminal lobes, which are not more than half, or two-thirds, of those in the type. Other characters identical.

Hab. In Japan, on *Orixa japonica;* specimens sent by Mr. Koebele (his No 1220): and in Ceylon, on *Loranthus*, sp., also from Mr. Koebele (his No. 1410).

The specimens from both localities are identical, and I think that they approach nearest to a form mentioned by Mr. Green ("Coccidæ of Ceylon," part i., p. 89) on *Geranium*. Originally Mr. Green proposed to name this *D. geranii*, but he afterwards attached it to *D. amygdali*. In two prepared slides which I possess of this form on *Geranium* I find that the dimensions of the terminal lobes vary considerably.

Genus Parlatoria.

Parlatoria sinensis, sp. nov. Plate XXIII., fig. 4.

Female puparium really whitish or yellowish, but covered usually with such a coating of fungus as to seem quite black. The puparia are massed together, encrusting the twig, so that the form of each is not easily made out; but it appears to be subcircular, somewhat convex, with a diameter of about $\frac{1}{30}$ in.

Male puparium flatter and more elliptical than that of the female; not carinated.

Adult female brownish-yellow; form normal. Abdomen terminating in the usual fringe of emarginate lobes, with serrated scaly hairs between them; but these scaly hairs seem to be less numerous than usual, and do not extend along the whole margin.

Hab. In China, on *Citrus aurantium*. My specimens are from Hongkong, sent by Mr. Koebele (I think, his No. 1571, but the number was indistinct).

There is little whereby to distinguish the species of this genus, but I think this is new, from the paucity of the scaly serrated hairs. An insect named by Mr. Cockerell *Aspidiotus biformis* (Canad. Entom., 1894, p. 131) has a margin rather remotely resembling this, but its lobes have smooth sides.

Parlatoria proteus, Curtis, var. **palmæ**, var. nov.

Puparia, both female and male, resembling generally those of the type, but with a darker appearance to the naked eye or under a weak lens, on account of the darker pellicles.

Adult female also resembling generally the type, but in all the specimens examined I find the scaly hairs on the abdominal margin narrower, and some of them, instead of being laterally serrated, are terminally forked; possibly in living specimens the typical hairs would be seen. There are four groups of spinnerets, anterior pair with eight orifices, posterior pair with six. The marginal lobes are normal.

Hab. In Australia, on date-palms in the northern district of South Australia. These palms were imported, as I understand, from Algeria about three years ago, and were planted near Lake Harry. My specimens were sent by Mr. A. Molineux, of Adelaide, and I also received some from Mr. French, of Melbourne.

Mr. Cockerell ("Entomologist," 1895, p. 52) describes, under the name *Parlatoria victrix*, an insect on date-palms in Arizona, imported from Egypt. Two of the characters which he gives are, "No grouped glands; plates scale-like." The latter character I am not able to interpret, but the figure which he gives of the abdominal margin does not agree with my Australian form. If he is right in stating that *P. victrix* has no spinneret groups it must be a different species, for in my specimens the groups are quite clear, and exactly as in *P. proteus*.

I have seen somewhere (but cannot verify the reference) that date-palms in Algeria are attacked by *P. zizyphi*, Lucas, and the dark colour, superficially, of the puparia of this Australian form might easily cause them to be mistaken for that. Mr. Cockerell also states that his *P. victrix* was

formerly supposed to be *zizyphi*. I suppose there is no doubt that the palms brought their parasite with them from Algeria. I reported in 1892 the type of *P. proteus* in Queensland, but it is not likely that it spread from there to South Australia.

Genus Mytilaspis.

Mytilaspis flava, Targioni, var. **hawaiiensis,** Maskell, 1894.

This insect occurs in China, on *Pyrus sinensis*. Specimens sent from Amoy by Mr. Koebele (his No. 1133).

In 1894 I established this variety on the absence of spines from the anterior abdominal segment. My Chinese specimens clearly exhibit these spines, and therefore the variety should probably be abandoned. But it may be convenient to retain the name for the present to indicate that the form is indigenous in the Far East and in the Pacific, as well as in Europe.

Mytilaspis spinifera, Maskell, *forma major*.

This form is identical with the type in everything but size, being quite twice as large, and averaging $\frac{1}{8}$ in. in length and nearly the same in breadth of puparium.

Hab. In Australia, on *Acacia pendula* (same as the type). Specimens from Hay, Riverina, New South Wales, sent by Mr. Musson.

Mytilaspis machili, sp. nov. Plate XXIII., fig. 5.

Female puparium dark-brown, elongated, pyriform; length about $\frac{1}{12}$ in.

Male puparium more cylindrical than that of the female; colour darkish-yellow; length about $\frac{1}{20}$ in. Some specimens are white.

Adult female brown; form normal. Abdomen ending in two moderate lobes with a small median depression in which are two small spiny pairs; these lobes are rounded with very inconspicuous lateral emarginations; beyond them on each side are two much smaller subconical lobes. The margin bears a few spines in pairs. Five groups of spinnerets; upper group with 4 to 6 orifices; upper laterals 6 to 8; lower laterals 8 to 10. Several dorsal tubular spinnerets.

Adult male unknown.

Hab. In Japan, on *Machilus thunbergii*. Specimens from Yokohama, sent by Mr. Koebele (his No. 1514).

In my list of the Koebele collection, published in the Ent. Mo. Mag. (October and November, 1897), I did not attach any name to this form, thinking that perhaps it might after all turn out to be a variety of *M. crawii*, Cockerell; but I now consider it as distinct. On the leaves sent to me there were

many more male puparia than females, mingled with *Aspidiotus ficus* and a species of *Parlatoria*.

Genus POLIASPIS.

Poliaspis pini, sp. nov. Plate XXIII., fig. 6.

Female puparium elongated, mussel-shaped; colour brown, with the pellicles orange and the abdominal end white. Length about $\frac{1}{10}$ in.

Male puparium similar in form and colour to that of the female; length about $\frac{1}{16}$ in.

Adult female brown, of the normal elongated form. Abdomen ending in an emarginate curve, minutely serrated, and with several elongated oval pores near the margin; in the middle four small lobes of equal size and two smaller ones. Between the lobes, and along the margin, are a few short spiny hairs. The anterior abdominal and the posterior thoracic segments bear some short marginal spines. Eight groups of spinnerets; the anterior row of three groups, of which the two lateral ones have about 4 orifices; the median one about 10; of the rest, the median group has 4 to 6; the upper laterals 10 to 12; the lower laterals about 12. There are several dorsal tubular spinnerets.

Male unknown.

Hab. In Japan, on *Pinus densiflora*. Specimens from Miyanoshita, sent by Mr. Koebele (his No. 1494).

The dark-coloured puparium is unusual in this genus; indeed, I originally established the name from the Greek πολίος (white, shining), and the other known species have this character.

Genus CHIONASPIS.

Chionaspis chinensis, Cockerell, Rep. State Board of Hort., California, 1895, p. 37.

Specimens of this insect were sent to me from Atami, Japan, on *Quercus acuta*, by Mr. Koebele (his Nos. 1496 and 1549). The form was originally described as on *Quercus* trees imported into California from China. Mr. Cockerell considers it as intermediate between *C. nyssæ*, Comstock, and *C. eugeniæ*, Mask., and I think he is right. Indeed, in my list in the Ent. Mo. Mag. (November, 1897) I set it down as probably *C. eugeniæ*, var.

Genus FIORINIA.

Fiorinia signata, sp. nov. Plate XXIII., figs. 7–9.

Female puparium greyish-white, rather widely pyriform; the single terminal pellicle is yellow; the surface of the

secreted portion is marked by rather strong transverse striæ, forming shallow corrugations. The second pellicle, which is yellow, occupies almost the whole puparium. Length about $\frac{1}{25}$ in.

Male puparium snowy-white, rather loose in texture, semi-cylindrical; length about $\frac{1}{20}$ in.; terminal pellicle yellow.

The second female pellicle is broadly elliptical, with both ends tapering rapidly. The cephalic end is truncate and smooth; the posterior end is broken by many small irregular denticulate lobules, between which are six or eight spines, the anterior spine on each side being rather strong.

Adult female yellowish-brown. Length about $\frac{1}{50}$ in. Abdomen terminating in a semicircular curve, broken by many irregularities, but there are no regular or conspicuous lobes. On the margin there are from fourteen to eighteen spines on each side, of which about half are short and fine, the rest long and strong. Four groups of spinnerets: upper groups with 14 to 18 orifices; lower groups, 12 to 16; in some specimens a small upper median group of 2 or 3 may be made out.

Hab. In Japan, on *Bambusa tessellata*. Specimens from Miyanoshita, sent by Mr. Koebele (his No. 1495).

The pyriform striated female puparium at once distinguishes this species.

Fiorinia camelliæ, Comstock. *Fiorinia pinicola*, Mask., Ent. Mo. Mag., Oct., 1897.

My identification of this in the Ent. Mo. Mag. was a gross error. Subsequent examination shows that there is no difference from *F. camelliæ*. The specimens were on *Pinus sinensis*, Hongkong, and on *Cupressus juniperinus*, Formosa, from Mr. Koebele (his Nos. 1529, 1130).

Fiorinia tenuis, sp. nov. Plate XXIII., fig. 10.

Female puparium pale-yellow, irregularly elliptical, very thin and transparent; length about $\frac{1}{40}$ in. The second pellicle is also extremely thin and brittle, and occupies almost all the puparium; its posterior extremity exhibits some irregular indentations, amongst which are some short and rather strong spines.

Male puparium white, but the specimens seen were not in good order.

Adult female greyish-yellow. Length about $\frac{1}{50}$ in. Abdomen exhibiting an irregularly serrated margin, the serrations bearing numerous rather strong and thick spines, but there are no regular lobes. Five groups of spinnerets, each consisting of from 5 to 8 orifices. The groups are so nearly contiguous as to form almost an arch. There are also several dorsal tubular spinnerets.

Hab. In Japan, on *Bambusa*, sp. Specimens from Miyanoshita, sent by Mr. Koebele (his No. 1510). This particular species of bamboo has, at the junction of the leaf-stalk with the leaf, a coating of short hairs on the underside, and the insects are found amongst these hairs, but are very inconspicuous.

The very thin puparium and pellicles and the spines on the abdominal extremity will distinguish this form. It differs from *F. saprosmæ*, Green, in the absence of a terminal abdominal depression, in having no marginal "jointed tubercles," and in the spinneret groups. The extremity of the second pellicle is not unlike that of *F. syncarpiæ*, Mask., an Australian form, but the adult differs.

Fiorinia bambusæ, sp. nov. Plate XXIV., figs. 1–5.

Female puparium very long and excessively slender; the length reaches $\frac{1}{13}$ in., the width only about $\frac{1}{150}$ in. The colour is white, but appears yellow, from the second pellicle showing through it. The texture is very thin and transparent. Sides straight and parallel.

Male puparium white, similar in form to that of the female; length about $\frac{1}{25}$ in.; width about $\frac{1}{150}$ in. The pellicle is yellow.

The first female pellicle is very pale-yellow, almost white, very elongate-elliptical, with parallel sides and smoothly rounded ends. The antennæ present no special features. I have not been able to make out the feet. The dorsum is covered with many transverse rows of minute specks, which, under a high magnification, appear multilocular, but they vanish in the medium employed for microscopic preparation.

The second pellicle is yellow, occupying almost all the puparium. The margin all along the sides is broken by minute irregular corrugations. Near the posterior end the pellicle is transversely segmented, and ends in a broad and shallow depression, and on each side a few rather strong spiny hairs.

The adult female is cylindrical and very slender. Length about $\frac{1}{40}$ in. Abdomen ending in a curve broken by very minute serrations, and in the middle two very small trifoliate lobes, each with an interior thickening of the epidermis; between and alongside these lobes are a few spiny hairs. But many specimens show no indications of lobes at all, the margin of the abdomen in them, all round, being almost entirely smooth. This form is very noticeable in one of my prepared specimens, which shows the adult still in the puparium, covered by the second pellicle, and I imagine that it results from a bending under of the extremity whereby the ultimate edge is hidden. I have seen the same smooth

curves in females extracted from the puparium. I can see only two groups of spinnerets, each with three orifices.

Adult male unknown.

Hab. In China, on *Bambusa fortunei*. Specimens from Hongkong, sent by Mr. Koebele (his No. 1534).

An extremely elegant and distinct species, remarkable for its length and slenderness. Mr. Green has a form, *Chionaspis* (originally *Mytilaspis*) *elongata*, on *Arundinaria*, which is a kind of bamboo, in Ceylon; but it is quite different in the puparium and in other characters.

Fiorinia nephelii, sp. nov. Plate XXIV., figs. 6–10.

Insects inhabiting small pits on the under-surface of a leaf. There is a corresponding elevation on the upper surface. Usually each pit contains three or four insects of different stages.

Female puparium yellow, but the median region appears dark-brown, from the second pellicle showing through it. The form is irregularly elliptical. Length about $\frac{1}{35}$ in.

Male puparium white, semicylindrical, not carinated; pellicle yellowish-brown; length about $\frac{1}{40}$ in. This puparium lies on the surface of the leaf, and not in a pit. When several are collected together the cottony secretion forms a mass of white fluff, the form of each being indistinguishable.

Larva in its early stage yellow, darkening with age, so that when its exuviæ form the first pellicle they are brown. Form regularly elliptical; length varying with age from about $\frac{1}{100}$ in. to $\frac{1}{60}$ in. The antennæ, feet, and terminal setæ are normal, but the margin, both in the male and the female, bears a number of rather long slender spiny hairs.

The second pellicle is dark-brown, elliptical, with a somewhat irregular edge. The posterior extremity has a conspicuous depression, the sides of which form minutely serratulate lobes; and on the abdominal margin there are a few short and thick spines.

Adult female entirely enclosed within the second pellicle, so that it is extremely difficult to extract. The form is normal. Colour brown; length about $\frac{1}{50}$ in. The abdomen ends in a depression with serratulate sides, as in the second pellicle, and there are a few short marginal spines. I have not been able to satisfy myself as to the spinnerets, but there are probably the usual five groups.

Adult male unknown.

Hab. In China, on *Nephelium longana*, and in Queensland, on the same plant. Specimens sent from Hongkong, Tamsui, and Brisbane, by Mr. Koebele (his No. 1417).

It was only after very considerable trouble that I was able to extract sufficient of the adult females from the

second pellicle to make out the abdominal characters, but I did not succeed in getting a single uninjured specimen.

The terminal depression and spines of the female, both second stage and adult, in this species approach those of *F. camelliæ;* but its habit of forming pits in the leaf, and also the long marginal spines of the larva, clearly distinguish it. Mr. Koebele sent me the specimens under the name *F. secreta*, Green, but they do not agree with that. I have specimens of *F. secreta* from Mr. Green himself, and I find them quite distinct. They form little rounded galls on the *upper* surface of the leaf, and there is either no visible orifice in the under-surface, or else a very minute one; whereas *F. nephelii* forms a pit in the *under*-surface, and merely presses out the upper surface in a small elevation. Moreover, the long marginal spines are very clear and conspicuous on both male and female larva of *F. nephelii*, whilst Mr. Green makes no mention of them in *F. secreta*. and I can see none in my specimens.

Section LECANINÆ.

Genus Ceroplastes.

Ceroplastes vinsonii, Signoret. Plate XXV., figs. 1, 2.

I have received from Dr. Anderson, of Calcutta, three specimens which I shall attach to this species; also a small coloured drawing of the insect as it appears when alive. These specimens agree altogether with Signoret's description, having the eight lateral waxy tuberosities and the central boss; moreover, in the specimen which I have prepared for microscopic examination I find the peculiar "arrow-headed" spines situated near the spiracular depressions, with spiny hairs posterior to them. These "arrow-heads" are made by Signoret a distinctive character of the species, and he separates *C. fairmairii* from *C. vinsonii* by the absence of spiny hairs from the former. Comstock (Rep. of Entom., 1880, p. 331) expresses a doubt whether these processes have sufficient specific value, for he says he finds them also in his species, *C. floridensis;* but it is quite possible that this may be identical with *C. vinsonii*. In any case, only three species of the genus are said to exhibit them.

Hab. In India, on *Thea*, at Darjeeling.

Genus Ceronema.

Ceronema japonicum, sp. nov. Plate XXV., figs. 3–9.

Female insects partially or wholly covered by closely-woven white semi-cottony threads; sometimes these are absent, except on the median dorsal region, the rest of the body being naked. On this median region the threads are very long, curl-

ing outwards in long elevated curves, and frequently extending beyond the margin.

Male pupa covered by a test of white secretion, which is rather more solid than that of the female, approaching to glassy plates. Some male tests exhibit median curling threads, but others do not. Length of male test about $\frac{1}{20}$ in.

Adult female yellowish, of normal Lecanid form, rather flat, with a slightly-raised median longitudinal ridge of rather darker colour; length about $\frac{1}{13}$ in. The outline is elliptical, rather narrowed anteriorly. Antennæ of seven joints, of which the fourth is the longest, then the third, and the rest are subequal; in the fourth there is a "false joint," so that it might be sometimes taken for two; there is one hair on the first, two on the fourth, and four to six on the last. Feet moderately thick; the tibia is only slightly longer than the tarsus; upper digitules slender, knobbed hairs, lower pair dilated. The abdominal cleft is normal, but in all the specimens examined I find two anogenital rings, one anterior to the other, both "compound," and both bearing several hairs; and there are two pairs of lobes, one to each ring. The margin of the body bears a double row of spines, one set being twice as large as the other. At each of the four spiracular depressions there is a group of about six much larger and longer spines. All over the body there are numerous scattered spinneret orifices of two sizes, the smaller ones being the most frequent. On the median dorsal region, where the raised ridge exists, there are two longitudinal series of short thick conical spines, extending from the rostrum nearly to the abdominal cleft.

Second stage unknown.

Larva yellow, active, flat, of normal Lecanid elliptical form; length about $\frac{1}{80}$ in. Antennæ of six rather thick joints. Feet and abdominal lobes normal. I cannot detect any median spines or orifices. The margin bears a series of fine hairs, not set closely together.

Adult male unknown.

Hab. In Japan, on *Ilex crenata*, and in India, on tea. My Japanese specimens are from Miyanoshita, sent by Mr. Koebele (his Nos. 1476 and 1478); the Indian ones were sent by Dr. Anderson, of the Indian Museum, Calcutta, who gives no particular locality.

I think that this form is clearly allied to the Australian *Ceronema banksiæ*, Mask., 1894, the principal difference being that the organs which produce the long curling threads are here on the median dorsum, whereas in *C. banksiæ* they are nearer to the margin. The result is that in the Japanese species the threads curl outwards, while in the Australian they curl inwards. Other differences, of course, are in the marginal spines, the antennæ, &c. I am not able to explain the

appearance of two anal rings, but these were constant in all my specimens, both from India and Japan.

I shall presently describe another Japanese insect—*Lecanium notatum*—also partly on tea, in which there are markings on the median dorsal carina; but that is different in other respects, as will be seen.

Genus LECANIUM.

Lecanium ficus, sp. nov. Plate XXV., figs. 10, 11.

Adult female elongated, narrow, convex, smooth, without dorsal carina; colour darkish-brown; length about $\frac{1}{7}$ in. Antennæ of eight joints, the third, fourth, and fifth the longest, and subequal, the sixth and seventh the shortest. Feet moderate; tibia not quite twice the length of the tarsus; upper digitules fine hairs, lower pair only slightly dilated. Margin bearing only a very few short hairs. Epidermis marked by numbers of oval spots, rather large, and on the abdominal region with some fine hairs.

Female of the second stage yellow, flat, elliptical; length about $\frac{1}{25}$ in. Antennæ of six joints. Margin bearing only a very few fine hairs.

Larva yellow, flat, elliptical; length about $\frac{1}{85}$ in. The antennæ and feet present no special features. The margin is very minutely crenulated, but bears no hairs. Terminal setæ moderate.

Hab. In China, on *Ficus*, sp. Specimens from Swatow (on the sea-shore), sent by Mr. Koebele (his No. 1349).

This form is allied to *L. longulum*, Douglas, and it also seems to be near to *L. anthurii*, Signoret, and to *L. terminaliæ*, Cockerell, but it appears to differ from all. *L. longulum* may perhaps (*apud* Douglas) have eight-jointed antennæ, *anthurii* has seven, and in *terminaliæ* the antennæ are not described. I shall leave the species separate for the present.

Lecanium ribis, Fitch.

I have received from Mr. T. W. Kirk specimens of this species on grape-vine from the Wairarapa district, New Zealand. They are identical with those mentioned in my paper of 1891 (Trans. N.Z. Inst., vol. xxiv., p. 22) as occurring on the same plant at Ashburton.

Lecanium berberidis, Schrank.

I reported this species from Australia in 1896 (Trans. N.Z. Inst., vol. xxix., p. 311), but with a note of interrogation, because I was not certain as to one character given by Signoret—viz., the swollen anterior tarsi and median tibiæ. Since then I have received, by the kindness of Dr. Berlese,

Part II. of his "Chermotheca italica," containing the European type of the species. On examination I find that these specimens also do not show any abnormal form of the feet, and that the only thing in which the Australian form differs is size, which may be accounted for by climate, food-plant, &c. If any note, therefore, is required, it need only be to add the words "forma major."

Lecanium notatum, sp. nov. Plate XXV., fig. 12–15.

Adult female yellow, flattish, with a slightly-raised longitudinal dorsal ridge; form elliptical; length about $\frac{1}{11}$ in. Antennæ of eight joints, of which the third is much the longest; next the fourth and second, which are equal; next the fifth; the rest short and subequal. Feet rather long; the tibia is twice as long as the tarsus; upper digitules long fine knobbed hairs, lower pair long and rather widely dilated. Margin bearing a single series of fine hairs. The dorsal ridge is marked by an irregular longitudinal series of polygonal cells; these cells disappear in a prepared and mounted specimen. Mentum monomerous.

Male pupa covered by a white glassy test of the usual angular-elliptical form, composed of flat polygonal plates.

Adult male yellow. Length about $\frac{1}{32}$ in. The spike is rather long, but there are no special characters.

Hab. In Japan, on *Pittosporum*, sp., and on tea. The male tests are most numerous on *Pittosporum*. Specimens from Atami, sent by Mr. Koebele (his No. 1475).

This species appears to be allied to *L. minimum*, Newstead, but differs in the antenna, in the proportions of the tibia and tarsus, and in the median dorsal cells.

Lecanium globulosum, sp. nov. Plate XXVI., figs. 1, 2.

Adult female semiglobular, the border somewhat flattened; colour clear yellow; diameter about $\frac{1}{8}$ in. Epidermis covered with many minute yellow spots, but no definite tessellation is apparent either in the natural state or after preparation for the microscope. Antennæ of six joints, of which the third is much the longest, the rest subequal. Feet moderate; upper digitules long fine hairs, lower pair long and very slightly dilated. Abdominal cleft, lobes, and anal ring normal. Margin without hairs.

Female of the second stage clear yellow, elliptical, flattish, with a median longitudinal dorsal carina; length about $\frac{1}{13}$ in. Antennæ of six joints.

Larva yellow, flat, elliptical; length about $\frac{1}{50}$ in. Antennæ of six joints. The margin is minutely crenulated; the spiracular spines are rather long, and there are some shortish fine hairs, set rather far apart.

Male unknown.

Hab. In China, on *Stillingia sebifera* (the "tallow-tree"). Specimens sent from Hongkong by Mr. Koebele (his No. 1541).

This insect belongs to Signoret's third series, and seems to be allied to *L. genevense*, *L. prunastri*, &c., species in which the dermal tessellation is extremely indistinct.

On the packet containing the specimens sent Mr. Koebele writes, "Covered over by ants." I found no ants in the parcel, and Mr. Koebele does not state that the species is subterranean, whilst the piece of the plant sent is clearly not part of a root. All ants, however, are not subterranean, as I understand.

Lecanium melaleucæ, sp. nov. Plate XXVI., figs. 3–8.

Adult female reddish-brown, elliptical, tapering anteriorly, very slightly convex, the median dorsal region darker coloured than the margins, but there is no conspicuous dorsal carina. Length averaging about $\frac{1}{9}$ in., but may reach $\frac{1}{7}$ in. Epidermis slightly rough with minute pustules, which, in a prepared specimen, appear as subcircular cells. In some specimens, on the median dorsal region, there is a longitudinal series of white waxy tufts, but these are by no means constant. Antennæ of (probably) six joints; the last three are confused, and may be four; the basal joint is very thick, the rest tapering, the third being much the longest; on the last are some short hairs, and there is a long hair on the second. Feet moderate; in the early adult the tibia is shorter than the tarsus, but when fully grown it is longer; the upper digitules are long fine hairs, the lower pair long and widely dilated. The margin bears no hairs, but there is a group of blunt spines in each of the four spiracular depressions. The rostrum is normal, the mentum globular, monomerous; in the early adult the rostral setæ, before passing through the mentum, are often encased in a sort of cylindrical sac, or agglomerated together; but I have failed to find this feature in a fully-grown specimen, and in the early state it seems to be not constant. The abdominal cleft, lobes, and anal ring are normal.

Female of the second stage lighter coloured than the adult, elliptical; length about $\frac{1}{20}$ in.; on the dorsum there is a slightly-raised longitudinal ridge, with two other transverse ones less conspicuous. Antennæ of six rather confused joints. The rostral setæ are usually encased as in the early adult.

Larva yellow, elliptical, flat; length varying from about $\frac{1}{65}$ in. in the earliest to $\frac{1}{40}$ in. in the latest stage. Antennæ of six rather thick joints. Feet moderate, digitules rather thick. Abdominal setæ moderate. Rostral setæ encased as in the second stage, the loop being usually very long, and reaching

almost to the abdominal extremity. Margin bearing a few scattered short fine hairs; spiracular spines rather long.

Male pupa covered by a glassy thin test of the normal Lecanid form, composed of polygonal plates. Length of the test about $\frac{1}{11}$ in.; but the central portion of this test is again covered by a snow-white mass of thicker and more waxy material, and this is, as a rule, divided on the median dorsal region by a shallow longitudinal groove, which becomes much deeper at the cephalic extremity, where the mass is separated into two parallel portions; at the abdominal extremity the two divisions converge; the lateral regions of the test bear narrow ridges of white wax covering the divisions of the plates; so that, on the whole, the upper covering of a test presents somewhat the appearance of the egg-case of a dog-fish, only snowy white.

Adult male dark-red; length about $\frac{1}{17}$ in., inclusive of the head and the spike. Wings iridescent, with red nervures. Haltere fusiform, with a single terminal seta bent into a hook. Antennæ of probably nine joints, but the divisions are not clear, and there may be ten; all have numerous hairs, four on the last joint being knobbed. Feet rather long, with numerous hairs on every joint. Anal spike moderate, slightly curved.

Hab. In Australia, on *Melaleuca*, sp. Specimens from Palmer Island, Clarence River, New South Wales, sent by Mr. Froggatt.

I am not able to attach this to any known species, on account principally of the curious rostral setæ of the female and the test of the male pupa. Externally, and to the naked eye, or under a weak lens, the female is not unlike *L. tessellatum*, but there is no dermal tessellation. I think it may fairly be considered as new.

Lecanium casuarinæ, sp. nov. Plate XXVI., figs. 9–14.

Adult female dull dark-red in colour, semiglobular; diameter averaging $\frac{3}{8}$ in.; dorsum sometimes smooth, sometimes with one longitudinal and two transverse ridges, not very conspicuous; scattered over the body are a number of minute specks of white wax, which, however, are scarcely visible to the naked eye or under a weak lens. The ventral surface is concave, with a thick margin, and covers a number of larvæ. Antennæ and feet entirely wanting, the only organs visible, even after preparation, being the rostrum, the spiracles, and the abdominal lobes. The rostrum is moderate, the mentum monomerous, the setæ remarkably long. The spiracles are very large, bivalvular, situated in deep depressions, with enormous tracheæ. Abdominal cleft normal, the lobes very small, triangular. The dorsal skin bears some

rather large scattered circular orifices which appear to be at the apices of small pustules; also a number of minute simple circular orifices. The margin bears only very few or no spines.

Female of the second stage elliptical, slightly convex. The true colour is red, but the dorsum is covered with a coating, not very thick, of white wax, not homogeneous, but composed of small polygonal segments as in the adult, only much more closely set, and almost wholly concealing the insect. The ventral surface is slightly concave, and varies in colour from dull-yellow to dull-red. Dorsally there is a longitudinal raised ridge and also two transverse ones, all rather inconspicuous as a rule. The length of the insect at this stage is about $\frac{1}{5}$ in. Antennæ and feet entirely absent. Rostral setæ extraordinarily long, coiled in a large circle before passing through the mentum. Abdominal lobes small and black. The spiracles, as in the adult, and the tracheæ, are enormously developed, and the spiracular depressions very deep. The margin of the body, all round, bears a row of moderately long blunt spines set closely together. Dorsally there are the same large spots and small orifices as in the adult, but these, especially the small ones, are very much more numerous.

Larva flat, regularly elliptical, active; colour dull-red; form normally Lecanid; length about $\frac{1}{20}$ in. Antennæ rather long, with six joints, of which the third is twice as long as any other; all the joints bear many hairs. Feet also rather long; the tibia is twice as long as the tarsus; tarsal digitules fine hairs, lower pair very slightly dilated. Abdominal cleft, lobes, and setæ normal. Margin bearing some spines, but not set so closely as in the second stage. The spiracular depressions are very deep, and bear club-like spines. The rostral setæ are enormously long.

Male unknown.

Hab. In Australia, on *Casuarina*, sp. Specimens from Myrniong, Victoria, sent by Mr. Lidgett, who says in his letter, "They were found in the centre of the branch, having evidently followed the hole left by the larva of the moth *Marogia gigantella*, Walk., and had taken up their abode about 18 in. from the point of entrance, quite safe from the attacks of birds, &c. Half a dozen ants seemed to be busy attending to them."

The burrow of the moth larva is rather less than $\frac{1}{2}$ in. in diameter, so that there is just room for these large Coccids to occupy it without too much crowding. It may be presumed that they do not begin to make use of this tunnel until after the moth has emerged, unless it does so from some other orifice than that where the larva enters; otherwise it is not easy to see how it could make its way out, as the Lecanids practically fill up most of the space.

This species is second in size only to *L. mirificum*, Mask., 1896, and in many respects is curious and interesting. The spiracles, which are only noticeable in the adult and the second stage, being absent from the larva, differ from those of any other Coccid with which I am acquainted; and, as my figures show, the irregular and pubescent joints of the larval antenna and foot are abnormal amongst the *Lecaninæ*. It is curious that the marginal spines, so numerous in the second stage, should disappear in the adult. The very extraordinary length of the rostral setæ in all stages is also a curious character, although it would not at all serve for specific distinction, seeing that scarcely any two species of Coccids have setæ of the same length, some being just as exceptionally short as those of *L. casuarinæ* are long.

Genus Pulvinaria.

Pulvinaria psidii, Maskell.

This species is evidently widely distributed in tropical and subtropical regions, and has been found in Ceylon, in China, and in Japan since I first described it from Hawaii in 1892.

Amongst the Koebele collection (his Nos. 1277, 1507) were many males. The male test is of the normal glassy angular form. The adult male is brown, about $\frac{1}{32}$ in. long; the feet rather long, the tibia three times as long as the tarsus; antennæ of nine joints; abdominal spike rather long and thick.

This insect appears to attack a good many various plants in hot countries.

Pulvinaria maskelli, Olliff, var. **spinosior**, Maskell.

Specimens of this species were sent to me by Mr. Musson, on *Pittosporum phillyræoide*, Richmond, New South Wales (collected by Mr. G. Valder); amongst them were a number of male tests, hitherto undescribed.

These tests present no special features, but are rather more waxy than usual, and also less angular, the corners of the plates being rounded off, so that the outline is almost or quite elliptical. I could not find a male insect.

Section HEMICOCCINÆ.

Subsection CRYPTOKERMITIDÆ.

Genus Mallococcus, gen. nov.

Mallophora, Maskell, 1896.

I am informed that my name *Mallophora*, for the Chinese species *M. sinensis* (Trans. N.Z. Inst., vol. xxix., p. 314), was employed by Macquart, in 1834, for a genus of flies. I must

therefore make a correction as above; probably the name now proposed will be free from any such objection.

Section COCCINÆ.

Genus Eriococcus.

Eriococcus graminis, sp. nov. Plate XXVII., figs. 1–3.

Adult females enclosed in sacs of white cotton, which are massed together, and appear as if encrusting the plant. These sacs are rather closely felted, elliptical. Length about $\frac{1}{10}$ in., but, being crowded together, it is not easy to make this out clearly. Sacs from which the female has fallen out are usually filled with empty white egg-shells.

Male pupa-sacs similar to those of the females, but smaller; usually mixed up with them on the plant.

Adult female elliptical, but shrivelling as usual at gestation; colour dull dark greenish-brown; length before gestation about $\frac{1}{15}$ in. Antennæ of seven joints, rather thick; the third is the longest. Feet rather long; tibia shorter than the tarsus, as usual in the genus. Anal tubercles and ring normal. Epidermis covered with very numerous fine rather short hairs interspersed with blunt spines, and on the margin the spines are arranged in a row, and are longer and thicker.

Larva yellow; form normal; length about $\frac{1}{80}$ in. Antenna of six rather thick joints. Foot bearing several hairs on the tibia and tarsus.

Second stage and male unknown.

Hab. In China, on grass. Specimens from Hongkong, sent by Mr. Koebele (his Nos. 1523 and 1546).

This form is not far removed from the New Zealand *E. pallidus*. It differs in the marginal spines, and also in the massing of many sacs together (but this last character may be due to the food-plant).

Eriococcus exiguus, sp. nov. Plate XXVII., figs. 4–6.

Sac of adult female yellow, elliptical, rather loosely felted; length about $\frac{1}{40}$ in. The sacs are entangled amongst the numerous hairs of the leaf.

Sac of male white, loosely felted, cylindrical; length about $\frac{1}{60}$ in.

Adult female brownish-yellow, of normal form, shrivelling at gestation. Length before gestation about $\frac{1}{70}$ in. Antennæ thick, with six subequal joints. Feet showing no peculiar characters. Anal tubercles rather long. Margin bearing a row of short, thick, sharply conical spines.

Larva brownish-yellow, of the normal elliptical form; length about $\frac{1}{110}$ in. The margin bears short, thick, conical spines, as in the adult.

Male unknown.

Hab. In China, on a plant the name of which was not sent to me. The leaves are light-green, rather like those of a rose, but covered on the underside with a dense pubescence. Some very small Diaspid male puparia are on the same leaves. Specimens from Hongkong and Tamsui, sent by Mr. Koebele (his No. 1525).

The extreme smallness, the yellow sac, and the marginal conical spines will distinguish this species.

Eriococcus eucalypti, Maskell.

Mr. Tepper informs me that this species, in South Australia, is usually accompanied by *Dactylopius eucalypti*, and that both are especially injurious to *Eucalyptus rostrata* (red-gum, river-gum), which is "simply ruined by it since the brush-tongued parrots and other sweets-loving birds have been exterminated in the locality." I do not remember noticing any previous observations as to the action of birds upon Coccids, excepting a remark of my own several years ago that the white-eye, or blight-bird (*Zosterops lateralis*), pecked at *Lecanium hesperidum;* and a paper by Mr. Newstead in the Ent. Mo. Mag., April, 1895, in which he states that four species of Coccids were found by him in the stomachs of birds in England. Mr. Tepper's remark is therefore of great interest, and will, I hope, induce some naturalist to investigate this subject, which is important in many respects.

Eriococcus paradoxus, Mask., var. **simplex,** var. nov.

Sac of female similar to that of the type, so closely felted as to seem waxy, but not (in the specimens seen) aggregated in such solid masses.

Adult female of a deep-red colour, similar to the type in the peg-top form, the terminal lobes, the anal ring, and the size, in the atrophied antennæ, and in the absence of feet, which are replaced by spines; but instead of large numbers of figure-of-eight spinnerets there are only moderate numbers of simple circular orifices, most of which are small, a few near the abdominal extremity being larger.

Hab. In Australia, on *Eucalyptus*, sp. Specimens from Albury, sent by Mr. Froggatt.

Genus Ripersia.

Mr. R. H. Pettitt, of Lansing, Michigan, U.S.A., was kind enough to send me specimens of an insect of this genus found in ants' nests in that region. He did not ask me to describe it, but I have suggested to him the name *R. myrmecophila.*

It appears to be distinguished from other species by its great pubescence, not only on the body, but also on the antennæ and feet.

I should attach this form to *Ripersia* on account of the six-jointed antenna. Mr. Newstead has included in this genus a number of species—*e.g.*, *R. pulveraria*, *R. tomlinii*, *R. tumida*—where the antennæ have seven joints. I am obliged, although with diffidence, to differ from him on this point, for I imagine that what has led him to such a conclusion is the absence of tarsal digitules, and this seems to be a character usually difficult to make sure of. I often find that the digitules in a dead specimen are broken off, and they are often frequently destroyed in the process of preparation. The digitules of the claw are more permanent. Moreover, in such species as *R. fraxini*, Newst., or *R. fagi*, Mask., the tarsal digitules are present, as also in this Michigan species. It would follow, therefore, that by-and-by we should have to further subdivide *Ripersia*, making a separate division of those with six-jointed antennæ and tarsal digitules, which would be a great pity. I prefer very much to put all the six-jointed forms (with otherwise Dactylopid characters) into *Ripersia*, leaving those with seven or eight joints (whatever their digitules) in *Dactylopius*, as being the plan least likely to lead to confusion.

Genus Dactylopius.

Dactylopius graminis, Maskell, var. **orientalis**, var. nov.

Insects enclosed in sacs of white felted cotton, which are massed together on the plant, the proper form of each being irregularly elliptical. Insect dark-purple or dark-brown, subglobular or slightly elliptical; length about $\frac{1}{15}$ in. Antennæ of seven joints, the first six subequal, the last as long as any two others. Feet moderate; digitules all fine hairs. Anal tubercles very inconspicuous, almost obsolete, with shortish setæ and fine hairs; anal ring with six hairs. Epidermis covered with numerous simple circular spinneret-orifices of two sizes.

Larva and male not observed.

Hab. In China, on stems of grass. Specimens from Hongkong, sent by Mr. Koebele (his No. 1501).

This is so near to *D. graminis*, described by me in the Trans. N.Z. Inst., vol. xxiv., 1891, p. 36, that I have decided to attach it to that species as a variety, on account of the seven-jointed antenna, the only conspicuously differentiating character. It differs from *D. herbicola*, Mask., 1891, in the form of the feet and in the entire sac, and it may be distinguished from *Ripersia tomlinii*, Newstead, 1892, by its aërial habitat, and by the smooth hairless feet (*R. tomlinii* has a

good deal of pubescence). The type of *D. graminis* came from the Cape of Good Hope.

Dactylopius syringæ, sp. nov. (?) Plate XXVII., figs 7, 8.

Adult females enclosed in very loosely woven snow-white elliptical sacs aggregated in a mass on the plant.

Male pupæ in similar but smaller sacs.

Adult female yellow; length about $\frac{1}{16}$ in. Antennæ of eight joints, the eighth being the longest and fusiform; the antennal formula is 8213 (45) (67); there are two or three hairs on each joint. Feet moderate; the trochanter bears a long seta; the tibia and tarsus have a few hairs on the inner margins; the tarsal digitules are fine hairs, digitules of the claw very slightly dilated. Anal tubercles rather broad, but not very prominent; each bears a seta and several short conical spines; anal ring with six hairs. Epidermis covered with numerous small simple circular spinnerets, and with a rather dense pubescence, many of the hairs, especially on the cephalic region, being rather strong and long. In two specimens examined there were three transverse elongated irregular spots on the dorsum, one on each of the anterior abdominal segments.

Larva not observed.

Adult male brown; wings grey; length about $\frac{1}{20}$ in. Antennæ and feet presenting no special characters. Abdominal spike short and conical; setæ and cottony "tails" rather long.

Hab. In Japan, on *Syringa amurensis*. Specimens sent from Atami by Mr. Koebele (his No. 1550).

I advance this species with some diffidence, because on the pieces of bark sent to me almost all the specimens were males, and I could only extract three females in a condition for observation. The antennal formula is not far removed from that of *D. cocotis*, Mask., 1889, or perhaps of *D. solani*, Cockerell, 1894. The latter, however, differs in other particulars. The cottony secretion of *D. cocotis* is much less distinctly separable into elliptical sacs (although even in *D. syringæ* the sacs are not very clearly defined). The male of *D. cocotis* is not known. Probably *D. syringæ* may be best separated from that species by the more conspicuous anal tubercles, the fewer hairs on the tibia and tarsus, and the longer dorsal hairs, which do not form tufts at the margin. For the present I shall leave it as a distinct species.

Section IDIOCOCCINÆ.

I established this section in 1892 (Trans. N.Z. Inst., vol. xxv., p. 236) for the express purpose of including a number of species which are of so peculiar a character that

they could not be made to enter into any known group or section. But even amongst themselves these forms present such divergences that it really might be quite possible to erect a new genus to suit each one. Such a proceeding, however, would be to me so distasteful that I prefer almost any plan to it. In consequence, when laying down the characters of the section I made them purposely extremely general, and as wide as possible. Unfortunately, in one instance I departed from this rule: I definitely stated that the anogenital ring was hairless. The departure was unfortunate, as it obliges me now to modify the sectional characters a little, a thing which it would have been better to avoid. Up to the present date I possess twenty-two species and varieties included in this section, and Mr. Cockerell has another—*Sphærococcus tokionis*.

But there are two of these species which depart from the general rule in having anal rings with hairs. For these, therefore, it seems necessary to erect a new genus; but, as in all other respects they enter into the section *Idiococcinæ*, and certainly cannot be satisfactorily placed in any other section, I shall simply enlarge a little the sectional characters, and lay them down now as follows:—

Idiococcinæ.

Adult females active or stationary; gall-making, or naked, or producing cotton or wax. Anal tubercles absent or rudimentary. Anal ring with or without hairs. Antennæ with usually less than seven joints, frequently atrophied. Body not prolonged posteriorly in a "tail."

The genera included in this section up to the present time will be—

Insects gall-making; form much elongated; anal ring hairless	*Cylindrococcus*.
Insects naked, or covered, or gall-making; form various; anal ring hairless	*Sphærococcus*.
Insects naked, or covered, or gall-making; form various; anal ring with hairs	*Chætococcus*.

At present the last of these three will include the insect described by me in 1892 as *Sphærococcus bambusæ*, and a new species lately discovered in China—*C. graminis*. The form reported by Cockerell as *S. tokionis* appears to be not unlike *bambusæ*, but I have not been able to make out the anal ring.

Genus Sphærococcus.

Sphærococcus parvus, sp. nov. Plate XXVII., figs. 9-11.

Insects dwelling in the rugosities of the bark of the plant, where their presence is primarily indicated by small tufts of

white cotton, in the midst of which are the yellowish-brown, hard, semiglobular tests covering the insects. The test averages about $\frac{1}{40}$ in. in diameter.

Adult female reddish-brown, globular, filling the test. The antennæ are almost completely obsolete, being represented by very minute tubercles bearing a few hairs. Feet absent. Anal ring simple, hairless; anal tubercles absent. Indeed, with the exception of some small circular multilocular spinnerets scattered on the dorsum the only visible organs are the rostrum and the spiracles. The rostrum is moderately large, with a monomerous mentum and shortish setæ; the spiracles are tubular.

Larva red; length about $\frac{1}{100}$ in. Form normal; antennæ of six confused short joints, on the last of which are two long hairs. Feet rather thick; digitules fine hairs. Anal tubercles prominent, but small; setæ moderate.

Hab. In Japan, on cherry. Specimens sent by Mr. Koebele (his No. 1521); locality not mentioned.

In the absence of organs there is only the test to fall back upon for distinction, and the size. I think that in both respects this species is new.

Amongst Mr. Koebele's parcels was one (No. 1515) labelled "Japan, on *Quercus*." I was unable to observe definitely any insects. There were some small brown tests on the bark, and one mutilated female extracted was reddish-brown, seemingly about $\frac{1}{40}$ in. in diameter, and without any organs visible. It is possible that this also was *S. parvus*.

Sphærococcus populi, sp. nov. Plate XXVII., figs. 12–16.

Adult female covered by a very hard and solid waxy test of a dull dense-black colour, considerably convex, circular in outline; diameter about $\frac{1}{13}$ in.; this test is roughened by numbers of minute polygonal pustules, which, after prolonged boiling in potash, and viewed sideways, form conspicuous elevations; on the median dorsal region there may be faintly discerned six small depressions, or pits, in two rows.

On turning over the test the flat ventral surface of the insect is seen surrounded by a ring of black wax, within which is visible some of the thin white powdery meal scattered over the interior of the test. This ventral surface is just as black as the test. It is very difficult to separate the insect from its covering, and the best plan for examination is to boil the whole together, when the dorsal part of the test, and the enclosed insect, become more or less transparent, though the marginal ring defies the action of the potash. When so treated it is found that the insect possesses six feet, although nothing can be seen of them by external observation.

It is probable that atrophied antennæ and an anogenital ring also exist, but both of these must be situated under, or close to, the marginal ring, and as this will not dissolve they cannot be made out. The feet are peculiar: the two anterior pairs are short, thick, and deformed, the joints much swollen, and the tibia and tarsus fused into one; the posterior pair are longer and more slender, and the joints can be separated. The rostrum is normal, the mentum probably dimerous. On the dorsum six round spots are visible in two rows, answering to the six depressions in the test. Epidermis much wrinkled. There are no clear spinneret-orifices, but towards the margin the skin is covered with great numbers of very minute puncta, which may be spinnerets, and also with rather large clear oval cells. If antennæ exist they must be extremely small.

Larva and male unknown.

Hab. In Japan, on *Populus tremula*, var. *villosa*. Specimens from Nikko, sent by Mr. Koebele (his No. 1492).

When publishing in the Ent. Mo. Mag. my list of Mr. Koebele's collection I had not made up my mind as to this species, but I think it is undoubtedly a *Sphærococcus*. In its hardness and resistance to potash it approaches *Chætococcus bambusæ*, and in the unequal and deformed feet *Sphærococcus inflatipes*.

Genus CHÆTOCOCCUS, gen. nov.

General characters of *Idiococcinæ;* anal ring bearing some hairs.

Chætococcus bambusæ. *Sphærococcus bambusæ*, Maskell, Trans. N.Z. Inst., 1892, vol. xxv., p. 237.

Mr. E. E. Green drew my attention some months ago to the fact that this species has hairs on the anal ring. When originally describing it I had great difficulty in finding the ring at all, on account of the excessive hardness of the epidermis, which refused to become transparent even after very long boiling; but I find one of my prepared specimens, after five years' immersion in dammar solution, sufficiently lucid to show some long hairs, which, as far as I can make out, are six in number, though there may be eight.

This species, originally from the Sandwich Islands, has since been found in Ceylon, and I hear lately from M. d'Emmerez de Charmoy that it is plentiful in Mauritius.

But Mr. Green, in the same letter to me, made the somewhat startling statement that he was convinced that specimens in Ceylon "identical with *Sphærococcus bambusæ*" were also identical with the genus *Antonina*, Signoret, a statement founded upon actual comparison with specimens of *A. purpurea*

sent to him by Herr K. Sulc. I confess that this, coming from so thorough a student of Coccids as Mr. Green, not only astonished, but rather disturbed me. *A. purpurea* is placed by Signoret (although not very definitely) amongst the *Acanthococcidæ*. I possessed in my cabinet a specimen sent to me by Signoret himself in or about 1881, but as it was a single one I did not like to remove it for examination, and I therefore wrote to Mr. Green and also to Mr. Newstead in the hope of procuring others. But later, in looking through some boxes of duplicates, I found that Dr. Signoret had sent me four specimens, three of which were in the box. Being thus enabled to examine the species microscopically, I can state definitely that there is no resemblance between *A. purpurea* and *C. bambusæ* except externally and superficially. I had already some suspicion of this, because Signoret's figure (in his pl. xv., 3A) bears no likeness at all to *C. bambusæ;* and his descriptions of both the adult and the larva, although by no means satisfactory, will also not agree with that species. But on examination I find that *A. purpurea* produces a good deal of dark-red or purple matter; that it easily yields to the action of potash; that the spinneret-orifices, the marginal hairs, the segments of the abdominal region, and the posterior extremity correspond with Signoret's figure, and are quite different from *C. bambusæ*. As for the larva, there is nothing in that of *C. bambusæ* resembling what Signoret calls the "striking and extraordinary" development of the rostral setæ in *A. purpurea*. Whatever, therefore, may be the superficial resemblances, the anatomical characters forbid me to place *bambusæ* in the genus *Antonina*.

It remains to note that this further inquiry of mine seems to indicate to me that *Antonina* was erroneously placed by Signoret amongst the *Acanthococcidæ*. The anal tubercles of *A. purpurea* resemble those of *Dactylopius* or *Ripersia* much more nearly than those of *Eriococcus* or *Planchonia*. However, I cannot positively decide this point without an examination of the larva and the second stage, which is not in my power at present. I am not aware of any account of the species since that of Signoret in 1874.

Chætococcus graminis, sp. nov. Plate XXVII., figs. 17–19.

Adult female partially (often almost wholly) covered by a coating of white cotton, which is closely felted, and looks sometimes quite solid. Insect dark-brown, semiglobular, becoming concave beneath at gestation; diameter about $\frac{1}{15}$ in. As usual in this section the principal organs have disappeared; the antennæ are reduced to mere tubercles, and the feet are entirely absent. The rostrum and spiracles are normal. Epidermis covered with great numbers of circular

spinnerets, which are most numerous at the abdominal extremity, where they are frequently tubular, and are mingled with many short fine hairs. The extreme abdominal margin also bears some hairs longer than the others. The anal ring is large, compound, and bears eight rather strong hairs. In the margin beneath it there is a shallow depression, and from this to the anal ring there is a band of much darker brown colour.

Larva and male unknown.

Hab. In China, on grass. Specimens from Hongkong, sent by Mr. Koebele (his No. 1520). The parcels were labelled "*Eriococcus*"; but, although the cottony sacs at first suggest that genus, the insect clearly does not belong to it. The specimens of the plant have been cut just at the surface of the ground, but I am not able to say whether the species should be called subterranean or aërial.

In the close assemblage of spinnerets on the abdominal region, in the much darker colour of that part, and in the terminal marginal depression, *C. graminis* resembles the Australian species *Sphærococcus casuarinæ*, Mask., 1891, but that species produces (as far as is known) no cotton, and its anal ring is quite clearly hairless.

EXPLANATION OF PLATES XXIII.–XXVII.

Plate XXIII.

Fig. 1. *Aspidiotus bilobis*, abdominal margin.
Fig. 2. *Aonidia elæagnûs*, abdominal margin of second pellicle.
Fig. 3. „ pygidium of adult female.
Fig. 4. *Parlatoria sinensis*, lobes and scaly hairs.
Fig. 5. *Mytilaspis machili*, lobes.
Fig. 6. *Poliaspis pini*, pygidium of female.
Fig. 7. *Fiorinia signata*, puparia, female and male.
Fig. 8. „ second pellicle.
Fig. 9. „ abdominal margin.
Fig. 10. *Fiorinia tenuis*, pygidium of female.

Plate XXIV.

Fig. 1. *Fiorinia bambusæ*, female and pellicles.
Fig. 2. „ spots on first pellicle.
Fig. 3. „ termination of second pellicle.
Fig. 4. „ adult female, diagram.
Fig. 5. „ pygidium of female.
Fig. 6. *Fiorinia nephelii*, insects on underside of leaf, male and female.
Fig. 7. „ elevations on upper side of leaf.
Fig. 8. „ larva, early.
Fig. 9. „ first pellicle.
Fig. 10. „ abdominal margin of female.

Plate XXV.

Fig. 1. *Ceroplastes vinsonii*, adult female, dorsal view.
Fig. 2. „ marginal spines.
Fig. 3. *Ceronema japonicum*, adult female, dorsal view.
Fig. 4. „ „ diagram.
Fig. 5. „ „ antenna.
Fig. 6. „ „ abdominal extremity.
Fig. 7. „ „ marginal spines.
Fig. 8. „ „ spines of spiracular depressions.
Fig. 9. „ „ conical spines of dorsum.
Fig. 10. *Lecanium ficus*, adult female, dorsal view.
Fig. 11. „ „ antenna.
Fig. 12. *Lecanium notatum*, adult female, dorsal view.
Fig. 13. „ „ antenna.
Fig. 14. „ „ foot.
Fig. 15. „ „ dorsal spots.

Plate XXVI.

Fig. 1. *Lecanium globulosum*, insects on twig.
Fig. 2. „ antenna of adult female.
Fig. 3. *Lecanium melaleucæ*, insects on leaf.
Fig. 4. „ adult female, dorsal view.
Fig. 5. „ „ dorsal cells.
Fig. 6. „ „ antenna.
Fig. 7. „ rostral setæ.
Fig. 8. „ test of male.
Fig. 9. *Lecanium casuarinæ*, adult female, side view.
Fig. 10. „ female, second stage, dorsal view.
Fig. 11. „ female, second stage, spiracle, trachea, dorsal orifices, and spines.
Fig. 12. „ larva.
Fig. 13. „ antenna of larva.
Fig. 14. „ foot of larva.

Plate XXVII.

Fig. 1. *Eriococcus graminis*, insects in sacs on leaf.
Fig. 2. „ antenna of adult.
Fig. 3. „ marginal spines of adult.
Fig. 4. *Eriococcus exiguus*, sacs on leaf.
Fig. 5. „ antenna of adult.
Fig. 6. „ marginal spines of adult.
Fig. 7. *Dactylopius syringæ*, insects on twig.
Fig. 8. „ antenna of adult.
Fig. 9. *Sphærococcus parvus*, insects on bark.
Fig. 10. „ adult female, dorsal view.
Fig. 11. „ adult female, side view, with cotton.
Fig. 12. *Sphærococcus populi*, insects on twig.
Fig. 13. „ pustules of test, side view.
Fig. 14. „ adult female, ventral view.
Fig. 15. „ anterior of foot.
Fig. 16. „ posterior of foot.
Fig. 17. *Chætococcus graminis*, insects in sacs on grass.
Fig. 18. „ adult female, dorsal view.
Fig. 19. „ adult female, abdominal extremity.